

WHAT IS CLAIMED IS:

1. A film recorder, comprising:
  - a film recording device configured to expose film media;
  - a flat panel display device configured to display a plurality of images;

and

- 5 an alignment unit coupled to the film recording device and to the display device, wherein the alignment unit is configured to position the flat panel display device with respect to the film recording device such that the film recording device can expose the film media to the plurality of images.

- 10 2. The film recorder of claim 1, wherein the flat panel display device is one of the group: liquid crystal display (LCD), organic light emitting diode (OLED) display, plasma display, electro luminescent (EL) display, silicon crystal display, liquid crystal display on silicon (LCOS).

- 15 3. The film recorder of claim 1, wherein the alignment unit comprises a distance adjustment unit configured to adjust a distance from the film recording device to the display device.

- 20 4. The film recorder of claim 3, further comprising:
  - a control unit coupled to the distance adjustment unit, wherein the control unit is configured to control the adjustment unit to adjust the distance from the film recording device to the display device.

- 25 5. The film recorder of claim 1, wherein the alignment unit further comprises an X-Y-Z gimbal coupled to the flat panel display device, wherein the X-Y-Z gimbal is configured to adjust an orientation of the flat panel display with respect to the film recording device.

- 30 6. The film recorder of claim 1, wherein the film recording device is one of the group: 16mm film camera, 35mm film camera, 70 mm film camera.

7. The film recorder of claim 1, wherein the film recording device is oriented with respect to the flat panel display device such that the optical path from the flat panel display device to the film recording device is substantially vertical.

5 8. The film recorder of claim 1 further comprising an illumination source coupled to the flat panel display device configured to increase output brightness of at least a portion of the display of the plurality of images.

10 9. The film recorder of claim 8, wherein the illumination source is one of the group: light emitting diode, light emitting diode array, strobe lamp, strobe lamp array, digital light projector.

15 10. The film recorder of claim 8 wherein the illumination source provides different color illumination to different portions of the flat panel display device.

11. The film recorder of claim 8 wherein the illumination source comprises red LEDs, blue LEDs, and green LEDs, and

wherein the red LEDs are configured to produce a peak wavelength selected from the group: 650nm, 630nm;

20 wherein the blue LEDs are configured to produce a peak wavelength selected from the group: 550nm, 530nm; and

wherein the green LEDs are configured to produce a peak wavelength selected from the group: 450nm, 445nm.

25 12. A method of recording images onto film media comprises:  
positioning an optical axis of a display portion of a flat panel display to be approximately parallel to an optical axis of a film recording unit;

displaying an image on the display portion of the flat panel display for a first duration; and

30 exposing the film media to the image on the display portion for a second duration.

13. The method of claim 12, further comprising adjusting a focal length of a lens of the film recording device in response to a distance from the flat panel display to the film recording device and in response to a size of the display area.

5 14. The method of claim 12, further comprising adjusting the second duration in response to the image.

10 15. The method of claim 12 wherein the flat panel display is one of the group: digital flat panel display, analog flat panel display.

15 16. The method of claim 12, wherein the flat panel display is a display from the group: LCD, OLED display, plasma display, EL display, silicon crystal display, LCOS display.

20 17. The method of claim 12 further comprising providing external illumination from an external illumination source to the flat panel display; wherein the external illumination source is one of the group: LED, LED array, strobe lamp, strobe lamp array, digital light projector.

25 18. The method of claim 17 wherein the external illumination source comprises one or more digital light projectors configured to display images in RGB and CMY color space.

25 19. The method of claim 17 wherein the external illumination increases the brightness of at least a portion of the flat panel display.

30 20. The method of claim 17 wherein a resolution of the flat panel display is different from a resolution of the external illumination source.

21. The method of claim 20 wherein the external illumination source provides a first illumination color to a first portion of the display portion and provides a second illumination color to a second portion of the display portion at the same time.

22. The method of claim 12 wherein exposing the film media to the image comprises:

directing a shutter of the film recording unit to open; and  
directing the shutter of the film recording unit to shut.

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23. The film media including the image exposed according to the method of claim 12.

24. A method for forming a recorded film media comprises:  
10 displaying a plurality of images on a digital flat panel display to be recorded onto unexposed film media;  
aligning an optical axis of a film recorder to be substantially parallel to an optical axis of the digital flat panel display;  
controlling a shutter of the film recorder to expose a frame of the unexposed 15 film media with at least one image from the plurality of images.

25. The method of claim 24 wherein the frame of the unexposed film media is exposed with more than one image from the plurality of images.

20 26. The method of claim 24 wherein spatial dithering techniques are used for images from the plurality of images.

27. The method of claim 24 wherein the digital flat panel display is selected from the group: LCD, OLED, plasma, EL, silicon crystal display, LCOS display.

25 28. The method of claim 24, wherein controlling the shutter of the film recorder comprises adjusting how long the shutter is open in response to the one image.

30 29. The method of claim 24 further comprising illuminating the flat panel display with an external illumination source, wherein the external illumination source is an illumination source from the group: white LED, colored LED, LED array, strobe lamp, array of strobe lamps, digital light projector.

30. The method of claim 29 wherein the digital flat panel display is positioned between the external illumination source and the film recorder.

5           31. The method of claim 24 further comprising:  
               illuminating the flat panel display with an external illumination source,  
               wherein the external illumination source is an addressable source, such that the  
               external illumination source illuminates different portions of the flat panel display with  
               different illumination colors.

10          32. The method of claim 31 wherein the external illumination source also  
               illuminates different portions of the flat panel display with different intensities.

               33. The method of claim 29 wherein the external illumination source  
               comprises light guides.

15          34. The method of claim 24 further comprising:  
               determining a number of frames to record for the recorded film media; and  
               charging a user based upon the number of frames.

20          35. The method of claim 24 further comprising printing an interpositive  
               from the recorded film media.